

**SYNTHESIZING CADMIUM SULFIDE-ZINC SULFIDE NANOPARTICLES  
USING WATER-IN-OIL MICROEMULSIONS AS A TEMPLATE,**

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Binary semiconductor nanoparticles of  $\text{Cd}_{0.5}\text{Zn}_{0.5}\text{S}$  were synthesized by mixing two water-in-oil microemulsions with one containing  $\text{S}^{2-}$  ions and the other containing a mixture of  $\text{Cd}^{2+}/\text{Zn}^{2+}$  ions in the water core. The mixed  $\text{Cd}_{0.5}\text{Zn}_{0.5}\text{S}$  nanoparticles were studied using absorption spectroscopy, fluorescence, and Transmission Electron Microscopy (TEM) observations. Absorption spectroscopy was used to confirm the size and mixture of  $\text{Cd}_{0.5}\text{Zn}_{0.5}\text{S}$  nanoparticles. The fluorescence under a UV lamp was used to confirm the change in the fluorescent properties of CdS when mixed with Zn. TEM was used to observe the particle size and crystal formations. This microemulsion-plus-microemulsion approach offers a simple method for synthesizing  $\text{Cd}_{0.5}\text{Zn}_{0.5}\text{S}$  nanoparticles with tunable size, composition and spectroscopic properties. In addition these particles can be protected with alkanethiols and precipitated to give well formed crystalline material. These new materials are expected to be of an importance to the electronic and photonic industries.

J.D. McDowell was supported by NSF-REU grant no. CHE-REU-0243760